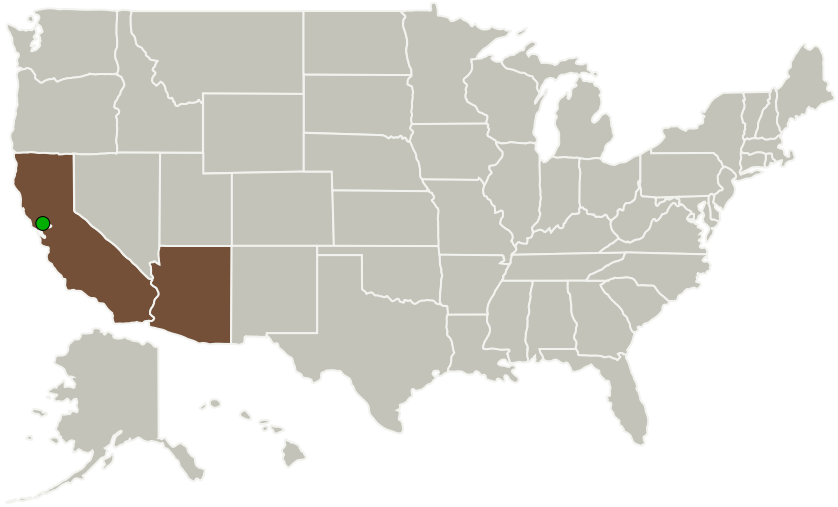
Aircraft Anomaly Prognostics, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

Ridgetop Group will leverage its proven Electromechanical Actuator (EMA) prognostics methodology to develop an advanced model-based actuator prognostic reasoner (MAPR). Ridgetop's concept is a self-contained, embedded prognostic reasoner with a passive connection to common avionic data busses. By monitoring actuator health in real time and providing early warning of incipient fault conditions, the proposed MAPR would enable condition based maintenance (CBM) of critical avionic flight control systems and support safer, more reliable next generation air transportation. The novel approach will effectively decouple the passive prognostic reasoner from the target flight control system, or actuator, and will support multiple avionic data bus interfaces, such as MIL-STD-1553, easing adoption, validation, integration, and support. Potentially, a single MAPR could monitor multiple flight control systems, reducing overall sensor costs. Furthermore, an embedded MAPR implementation with field upgradeable firmware would support evolving interface standards and prognostic health measurement capabilities. Finally, the proposed MAPR architecture is ideally suited for hardware-in-the-loop (HIL) testing, which dramatically accelerates technology readiness and commercial introduction.

Primary U.S. Work Locations and Key Partners



Aircraft Anomaly Prognostics, Phase I

Table of Contents

Aircraft Anomaly Prognostics, Phase I

Completed Technology Project (2010 - 2010)

Organizations Performing Work	Role	Type	Location
Ridgetop Group, Inc.	Lead Organization	Industry Women-Owned Small Business (WOSB)	Tucson, Arizona
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
Arizona	California

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140521)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Ridgetop Group, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

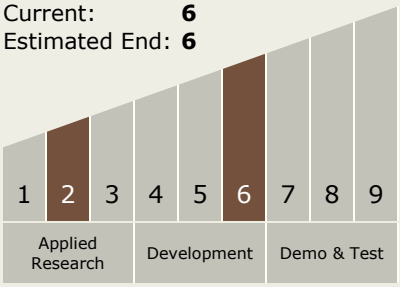
Carlos Torrez

Principal Investigator:

Neil Kunst

Technology Maturity (TRL)

Start: **2**
Current: **6**
Estimated End: **6**



Aircraft Anomaly Prognostics, Phase I

Completed Technology Project (2010 - 2010)

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.4 Information Processing
    - TX11.4.2 Intelligent Data Understanding

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System